TBS®
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Paraffin Dispenser

Catalog # PD-120, PD-220

Operator's Manual

Version 1.5, May 2006

Be certain to read this manual thoroughly
before proceeding with unpacking and installation.

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INTRODUCTION

Congratulations on your decision to purchase a TBS® 6.25-Gallon Paraffin Dispenser. Your instrument is designed to meet the large volume requirements of today's histology laboratory by offering the convenience of having 6.25 gallons of molten paraffin available at all times. While one low-wattage heating element remains on continuously to prevent clogging within the spout, two other higher wattage elements are microprocessor-controlled to maintain 1°C temperature accuracy within the paraffin reservoir. A sensor positioned on the outside cylinder wall detects temperature changes precipitated by the introduction of solid paraffin pellets. A complex software algorithm immediately responds by increasing the temperature of heaters at the bottom of the cylinder and/or surrounding the cylinder wall. As the pellets melt and the temperature approaches the set point, the software cycles both elements on or off as required to maintain the set point. A safety overheat protector device (88°C) is appropriately positioned to provide additional security.

SYMBOLS AND CONVENTIONS

Important Notice

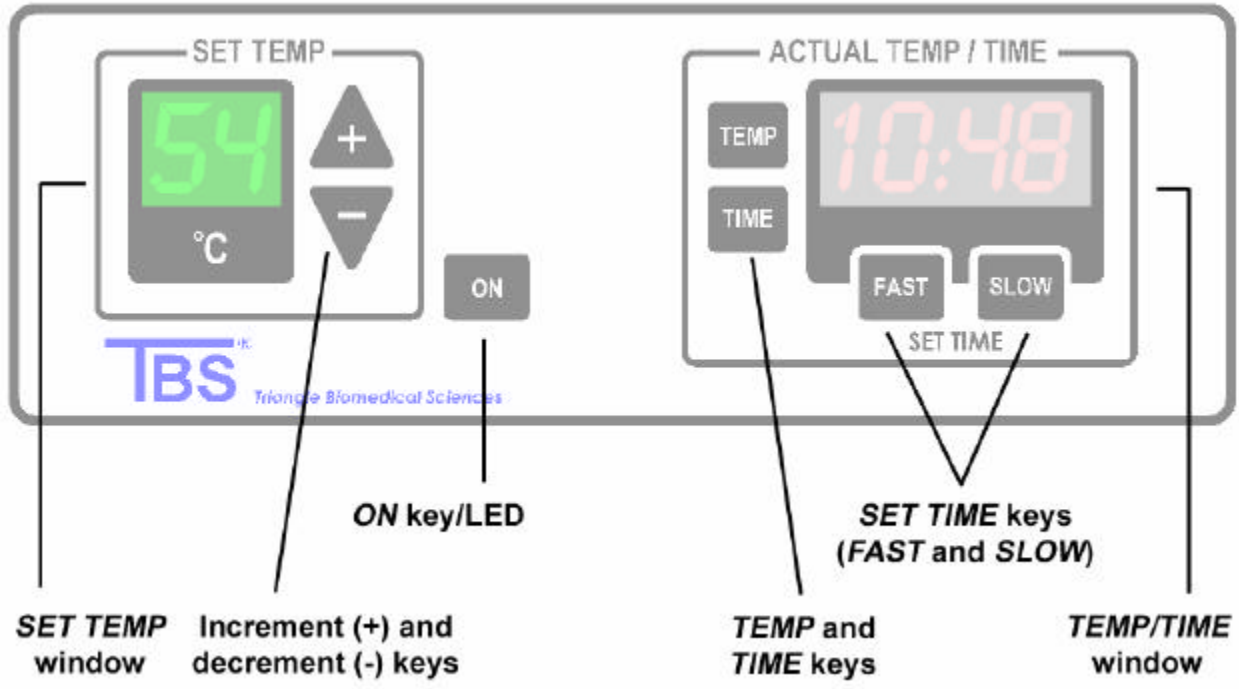
Refer to documentation before operation

Hot Surface

OVERVIEW AND SPECIFICATIONS

TBS® Paraffin Dispenser (PD)

PD Control Panel



Specifications

Dimensions	Height 21.5" (546.1mm) Width 14" (355.6mm) Depth 16" (406.4mm)
Voltage	120V AC ± 10% 50/60Hz single phase
Current	4.5 amps
Power	540 watts
Default temperature setting	55°C
Maximum temperature	60°C
Heat output	1885 BTU/hr (typical)
Weight	Unit 20.2 lbs (9.072 kg) Shipping 28 lbs (12.7 kg)

INSTRUCTIONS

1. Remove the equipment from the shipping carton carefully. Save the shipping carton and all packing material until proper operation of the equipment is confirmed. Immediately notify the carrier if there is any visible damage to the carton or its contents. Failure to do so may limit your ability to obtain compensation for damage.

   NOTE: The inner chamber of your instrument has been treated with an oil-based protectant. Please clean the chamber thoroughly with alcohol before filling to avoid the contamination of paraffin.

2. Connect the power cable to the unit and into a properly grounded 120V outlet.

   NOTE: If your unit was shipped outside of the U.S., check the label on the rear of the instrument for the electrical requirements.

3. Switch the *ON/OFF* switch at the rear of the unit to the ***ON*** position.

4. Immediately upon turning the unit on, the *SET TEMP* and *TIME/TEMP* windows will display ***8888*** for approximately 4 seconds. The unit will then display ***PASS*** or ***FAIL*** in the *TEMP/TIME* window for 4 seconds. If ***PASS*** appears, ***06:00*** will appear in the red LED window and flash until set, while the *SET TEMP* window will display the factory preset temperature of ***55°C***.

   NOTE: If ***FAIL*** appears in the *TEMP/TIME* window, the *SET TEMP* LED will be blank and the beeper will continue to sound. Press any switch to discontinue the beeping. Although the water bath may appear to function normally, the ***FAIL*** message indicates that the software has found a problem with the unit, and the unit should be returned for service. Phone our customer service department immediately for further instructions.

5. Press the *ON* key to initiate the paraffin reservoir heaters. The small red LED indicator will light up.

6. You may now set the clock by pressing the *SET TIME FAST* or *SET TIME SLOW* keys. Press the *TEMP* key to the left of the *TEMP/TIME* display if you prefer continuous monitoring of the bath temperature.

7. To increase or decrease the preset reservoir temperature, press and hold the increment (up arrow) key or the decrement (down arrow) key until the desired

temperature is displayed in the *SET TEMP* window. The maximum operating temperature is ***60°C***.

8. Leave the *TEMP/TIME* display in the *TIME* mode for continuous monitoring as a clock, or press the *TEMP* key to view the actual paraffin temperature. It is not necessary to unplug the paraffin dispenser while not in use for short periods of time, as this will cause any user-defined time clock and chamber temperature set points to be lost.

PRECAUTIONS AND MAINTENANCE

- When initially melting a full reservoir of solid paraffin pellets, please allow approximately 3 hours. For laboratories that are constantly replenishing large amounts of paraffin, we recommend that you keep your unit set at ***62°C*** to ***65°C***. Your meltdown time will be significantly decreased.

- The Paraffin Dispenser is designed to run continuously to maintain large volumes of molten paraffin; however, any power surge or disruption will activate the safety cut-off switch, shutting the unit off. TBS recommends that the unit be connected to a surge protector or some form of uninterrupted power source to ensure against such disruptions.

- Occasionally check the filter located in the bottom of the paraffin well, as particle buildup may interfere with the flow volume. The spigot can be removed and cleaned in the event that clogging does occur. Simply loosen the knurled knob at the front of the spigot (**IMPORTANT:** please ensure that the reservoir is empty) and use forced air to clean the valve. Avoid probing the spigot valve with sharp objects, as they may puncture the seal.

- A spare 6.3 amp fuse is provided in the fuse holder located in the power entry module in the rear of the unit.

REGULATORY COMPLIANCE

The **PD-120/220** has been tested by a registered independent body to rigorous international quality and safety standards, and has been found to be in compliance with the following regulations and specifications:

TUV Rheinland of North America, Inc. C US	**UL** 61010A
	CSA 1010-1
	CE EN/IEC EN61010-1, Safety EN61000-3-2, Harmonic Distortion EN55011, Emissions EN61326, Immunity EN61000-3-3, Voltage Fluctuation/Flicker

ERROR CODES

An error condition exists when the beeper sounds an alarm and the *SET TIME* LED display flashes an error code. The error code indicates one of the specific problems as described below:

Error code	Problem
E0	General system failure
E1	Sensor #1: Temperature over 70°C
E2	Sensor #2: Temperature over 72°C

TROUBLESHOOTING

Problem	Probable cause	Solution
Unit has no LED display.	• No power from main. • Blown fuse. • P3 disconnected.	• Connect cord plug to main. Switch unit on. • Replace with correct fuse rating. If problem persists, consult qualified personnel. • Reconnect P3.
No response or audible beep when keypad is depressed.	• Defective keypad. • Microprocessor lockup (power surge).	• Replace keypad (call TBS). • Switch unit off, wait 3 seconds, switch back on.
Solid block of paraffin not melting, but will dispense some liquid paraffin.	• Set temp too low. • Defective band heater. • Defective solid state relay (K2).	• Increase set temp to 65°C. • Check resistance value for approx. 55Ω at P4 pin 4 & 1. • Replace heater (call TBS).
Paraffin not melting. No liquid wax dispensing, no increase in temperature.	• Keypad LED not lit. • Disconnected P4. • Defective controller board and/or firmware.	• Press the *ON* switch. • Reconnect P4. • Replace controller board (call TBS).
Paraffin completely melted. Actual and set temp agree but unit will not dispense wax.	• Defective spigot heater. • Defective solid state relay (K4).	• Check resistance value for approximately 1200Ω at P3 pin 2 and P4 pin 6. • Replace controller board relay (call TBS).
Paraffin completely melted. Actual and set temp agree but unit will not dispense wax, *and* spigot is hot to the touch.	• Foreign objects block spigot or drain.	• Remove foreign object.
Spigot leaks at the handle.	• Defective seat cup.	• Replace seat cup.
Spigot drips.	• Foreign debris not allowing closure. • Seat cup not fully seated.	• Switch unit off and remove the spigot handle to expose silicone seat cup. Clean cup thoroughly and reinstall. • Remove seat cup and reinstall, ensuring proper seal.
Slow or limited temperature increase; spigot is hot to the touch, but paraffin does not flow.	• Defective bottom heater. • Open safety over heat protector (thermostat). • Defective solid state relay(K1).	• Check resistance value of the bottom heater approx. 51Ω at P4 pins 2 and 3. • Replace thermostat. • Replace relay.
E1 error code, temp display reads ***HI*** but paraffin reservoir not overheating.	• Defective bottom temperature sensor. • Sensor disconnected P2. • Defective controller board.	• Replace sensor (call TBS). • Reconnect P2. • Replace controller (call TBS).

Problem	Probable cause	Solution
E1 error code; temp display reads ***HI*** but there is an indication of the paraffin overheating.	• Defective K1 (solid state relay) shorted. • Defective temperature sensor or sensor wiring. • Defective controller board. • Out of calibration.	• Call TBS for replacement. • Call TBS for replacement. • Call TBS for replacement. • Call TBS for calibration procedure.
E2 error code display reads ***HI*** but there is no indication of overheating.	• Defective band temperature sensor. • P2 disconnected. • Controller board failure.	• Call TBS for replacement. • Reconnect P2. • Call TBS for replacement.
E2 error code display reads ***HI*** but there are indications that the paraffin is overheating.	• Defective band temperature sensor. • Solid state relay K2 shorted. • Controller board defective. • Out of calibration.	• Call TBS for replacement. • Call TBS for replacement. • Call TBS for replacement. • Call TBS for calibration procedure.

CONTACT INFORMATION

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